

Solution of Single, Permanent, Continuous, Clean and Free Energy Source

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November 23, 2022

Abstract

Purpose: To propose a clean, maintenance-free, free of charge, uninterrupted and permanent energy source solution for mankind.

Methods: Based on the all known fact that solar energy is relatively unlimited to create an idea of how to harness such unlimited energy on earth. Results: A possible solution has been found to realize such goal. Conclusion: We can build such solution and benefit all mankind for thousands of years because all the technologies needed are available at present time.

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Keywords

Single; Permanent; Continuous; Clean; Free;

1. Introduction

Today, human beings urgently need a permanent, continuous and clean energy source, I will propose a technical solution to such a need in the following text. This is completely based on the ultimate fact that the earth always has a hemisphere to receive the sun's light. This fact has been there for billions of years. Therefore, as long as we have a set of infrastructure to continuously receive the sun's light, we can provide such an energy source that can last as long as the lifetime of our solar system. And such a set of infrastructure is the solution I want to propose, that is, a distributed solar electricity grid that is deployed along the spin direction around the globe. Below, I will provide an example of a simple DC grid connection design to illustrate the technical feasibility of this solution.

2. Proposed Solution

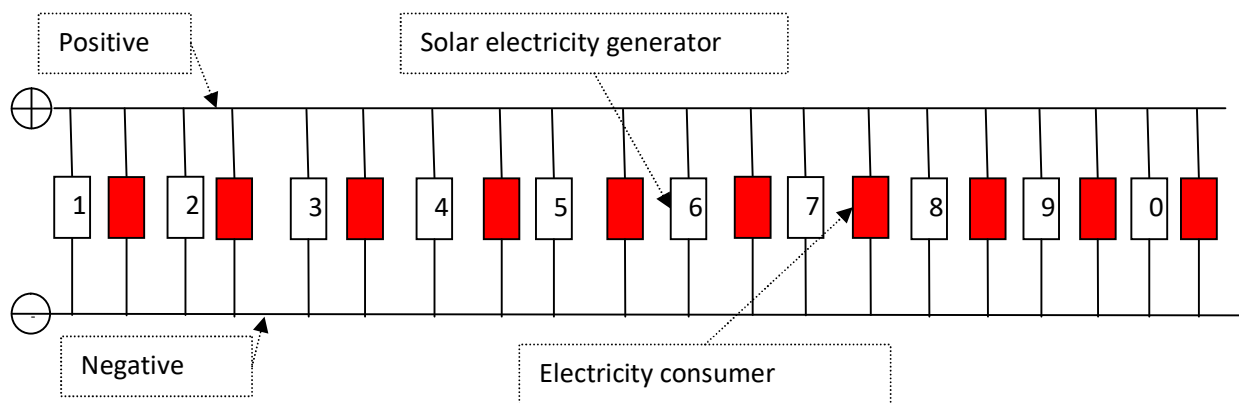


Figure 1

In Figure 1 above, there are two parallel conducting wires, the upper wire is the positive, and the lower wire is the negative. Two kinds of equipment are connected between the wires, namely solar electricity generator and electricity consumer. As shown in the Figure 1, the positive electrodes of the solar electricity generators and the electricity consumers are connected to the positive wires, and their negative electrodes are all connected to the negative wires. If the positive and negative wires are connected end to end respectively, a positive loop and a negative loop are formed, and the equipment connected between the two loops remains unchanged, as shown in Figure 2 below. Suppose that there is a continuous light source on the left to illuminate the solar electricity generators connected between the loops on the right, then half of the electricity generators will receive light to generate electricity, and the other half of the electricity generators will not generate electricity because of no light received. If the two loops and all the equipment connected between them are rotated, half of the electricity generators will still always be illuminated and keep generating electricity. However, with the

rotation, the electricity generators in the front will not receive light and stop generating electricity, and the electricity generators in the back will receive light and start to generate electricity. The process over time is that the electricity generators 1,2,3,4,5 go online and the generators 6,7,8,9,0 go offline; After a period of time, the generators 1,7,8,9,0 go offline and the generators 2,3,4,5,6 go online; After another period of time, the generators 1,2,8,9,0 go offline, the generators 3,4,5,6,7 go online, and so on.

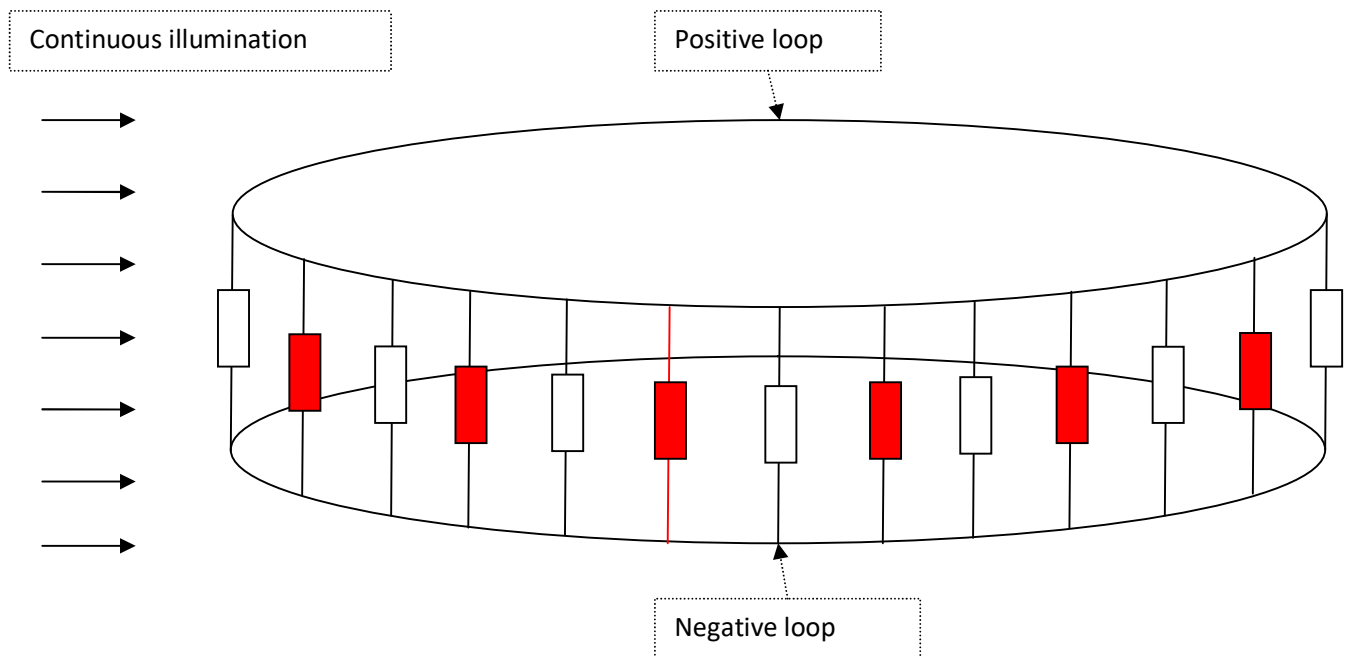


Figure 2

Suppose that the above-mentioned loop is laid along the latitude of the earth, and a large number of electricity generators and consumers are added between the positive and negative loops. Then as the earth spins, half of the electricity generators will always be illuminated with the sunlight and keep generating electricity. In this way, we can have a global grid that can continue to provide electricity to the consumers. Next, if we add more wires and connections to the positive and negative loops respectively, and at the same time narrow the parallel distance between the positive and negative wires, we can establish a huge two-way or two-line or two-circuit network, where the positive and negative wires are connected in exactly the same way and extended in parallel, as shown in the Figure 3 below. The positive loop meshwork and negative loop meshwork are exactly identical.[1]

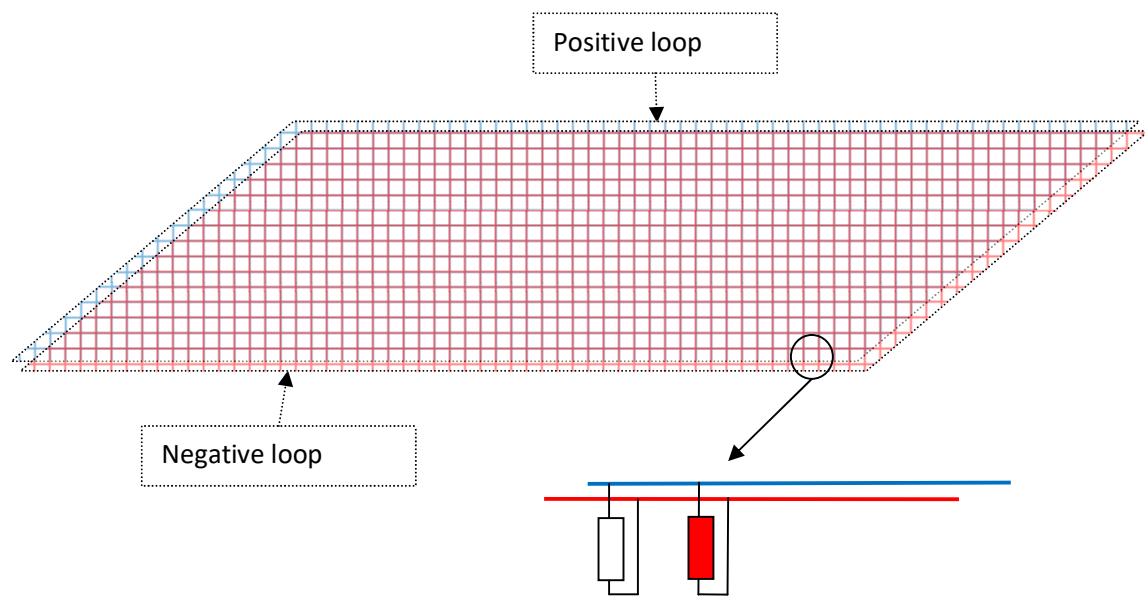


Figure 3

And moreover, we can expand this network unlimitedly as needed, adding electricity generators and consumers at any location. We only need to lay such a network along the spin direction of the earth or the latitude direction, and then plan the configuration and number of electricity generators and consumers and expand the network coverage according to various factors such as quantity of illumination, climate, topography, average length of daytime, local conditions, total demand, and etc. At last, we will have a global electricity grid with relatively dynamic balance between supply and demand.

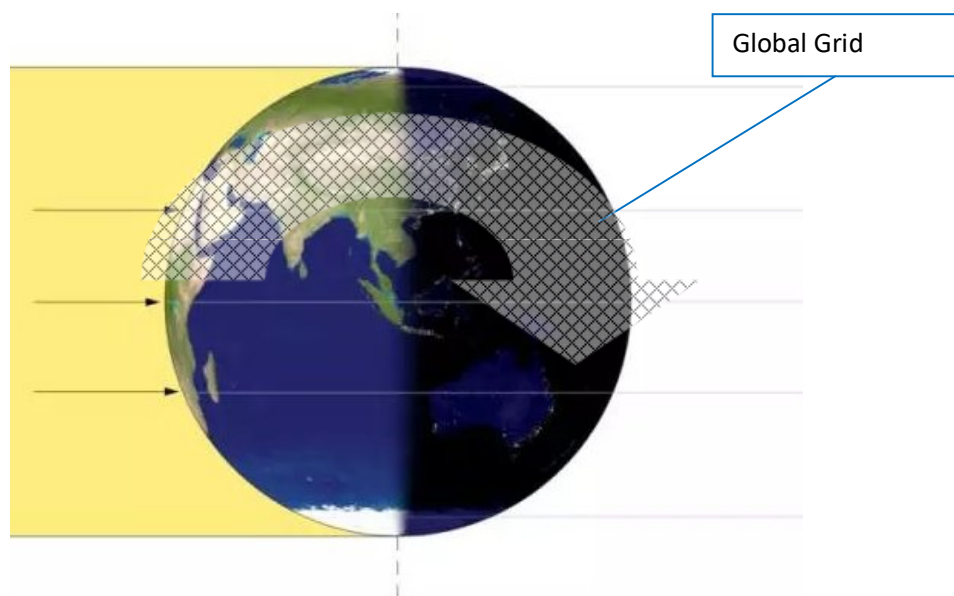


Figure 4

3. Discussion

Now, let me explain why the above solution is single, permanent, continuous, and clean.

3.1 "Single" means one source of energy, no other sources are needed as supplements. As a single source of energy, can we only utilize solar energy to provide energy for all mankind? The answer is yes. I don't need to list the specific data in this article, because we all know that the total radiant energy from the sun to the ground is much higher than the total energy consumption of human activities, which is beyond doubt. In other words, solar energy alone is enough to meet the energy needs of everyone, and it does not require any other assistance, supplement or backup.

3.2 "Permanent" means that such energy can exist forever. If we want to find a permanent energy source that will not be exhausted or used-up, then we must look beyond the earth. If the earth is regarded as a closed system, then no matter what resources or energies or how huge their reserves are contained in this closed system, these resources or energies are limited. So if resources or energy are limited, they will be exhausted or depleted one day. This is a simple addition and subtraction problem. So if we want a permanent energy that will not be exhausted, we should not look for it on the earth, but should look for it outside the earth. There is only one source of energy that continues to send energy to the earth from the outer space, and that is the sun. So if we want an energy that can last for ten or twenty years or more, then we currently have several options, such as fossil fuels and nuclear energy. But if we want a kind of energy that can last for forever, the sun is only option. As long as our solar system can maintain the status quo, such energy can be sustainable, and this time span can be regarded as permanent. I don't think I need to argue on this point, and no one has any objection.

3.3 "Continuous" means that the supply of energy is uninterrupted. As a permanent and clean energy source, solar energy has not become the primary choice of energy source for mankind. The reason is not that we currently do not have the appropriate technology to utilize solar energy, or that the total amount of solar energy we can use cannot meet the total energy consumption of mankind, but because the current method of solar energy utilization cannot provide a continuous and stable energy source. In other words, the current solar electricity generation facilities cannot guarantee continuous and uninterrupted energy supply. The energy output generated by our current solar electricity technology is always affected by geographical locations, day and night shift, and weather changes, and other uncontrolled factors and cannot guarantee a long-term constant output. Therefore, if solar energy is to replace all other energy sources and become the only energy source that mankind depends on, its continuity must be guaranteed. That is, we must ensure that solar electricity generation facilities can continue to provide a relatively stable total output, even if they operate for thousands of years, they will not be interrupted or malfunctioned. The global solar electricity grid I proposed can meet this requirement. Although the land coverage of different regions varies greatly, the intensity and total amount of radiation on different locations vary tremendously, the climate and weather

conditions are also constantly changing, and the spin and revolution of the earth also produce periodic disturbances, but we can still achieve a relatively stable output range by the appropriate geographical distribution and power regulation and other means. We can imagine that such a global grid must be connected to billions of electricity generators and consumers. There will be a large number of generators and consumers going online and offline at every moment. We only need to ensure that total supply is always greater than total demand. At the same time, the distributed electricity grid will not be paralyzed or interrupted due to local factors (such as earthquakes, storms or other natural disasters) or some equipment failures.

3.4 "Clean" means that the energy source will not cause pollution. The equipment and technologies to utilize solar energy are diverse and varied. Solar energy has been widely recognized as a clean energy source, and how clean the above global grid is depends entirely on the electricity generators we implemented on the grid. For example, photovoltaic electricity generation has no emissions, pollution, or even noise.

3.5 "Free" means it will be free for everyone; that is we don't need to pay for energy anymore. The global solar grid I proposed above is not "No Pain, No Gain" mode, instead it is "Free Lunch" mode, and the sunlight is the big long lasting lunch free of charge for everyone. What we need to do is get the right tableware to eat them. And such global solar grid is the only right tableware in a foreseeable future. So why it has to be free? Because one day in the future, no one will have to work anymore, no one will be burdened with "make a living" and no one will have to do something to get paid; the so called money that was created by human thousands of years ago will be eliminated from this planet. To have this future, the first step is to provide everyone free energy, and with artificial intelligence or automation technology, the basic needs such as water, food, housing, transportation and etc will be free too one after another. And one day, we will have some infrastructure that can satisfy almost every basic needs of everyone on this planet, just like the free air for everyone to breathe. We will die if we don't breathe for 2-3 minutes, and such a vital necessity that all the life depends on is free of charge for everyone. Why the air is free? The reason is that the earth or the solar system has built some infrastructure to generate relatively unlimited air for us and all other life to breathe freely. So if we move to other planet, like Mars, breath will be the most expensive thing to do, even though it is free of charge on earth. However, if we can build an infrastructure on Mars to generate breathable air like on earth, do we have to charge people on Mars for breathing of air there? That is why that it is the key idea behind this text is to make energy free for everyone to use, because the infrastructure that can provide free energy for everyone is the basis for the future I talked about, and I believe this future is inevitable, one way or another, sooner or later, we will get there.

3.6 So how we can build such global solar grid to provide free energy for everyone? Such an overarching global solar grid requires innumerable international cooperation, the participation by almost all countries, continuous investments of astronomical numbers, public's approval and acceptance, and other almost insurmountable political and cultural challenges. So many huge inextricable difficulties make it almost impossible to build such a grid in the end. Although the

idea is feasible, all of this will be windbaggy, because the work is too immense to start. But in fact, we only need a very strong two-wire cable at first, long enough to circle the high latitudes of the earth. Then we need to set up a certain number of photovoltaic power stations and electrical consumers according to the quantity and distribution of illumination, as shown in Figure 2 above. Next, we just need to put this simplest solar loop grid into operation, so that everyone can see that it can provide free, stable and uninterrupted energy. Finally, after a few years of stable operation of this single-loop power grid, more people will be attracted to join in, and a larger and more mature global power grid will be realized. At bottom, such a global solar power grid must be the only energy source in the future, because in the future we have no other option, either we proactively choose it now, or we are forced to accept it some years later.

4. Conclusion

Actually, we now already have many electricity grids covering the globe for usage by entire human race, but all these grids are not connected to each other, and the flow of energy is also chaotic. If we can transform the existing grids and connect them together to form a global grid, and then gradually incorporate solar electricity generators (preferably clean and maintenance-free technologies such as solar panels), and gradually phase out existing non-solar equipment (such as thermal electricity, nuclear electricity, etc.). In the end, we will have a clean, maintenance-free, continuous, permanent, and completely free of charge global grid that is completely dependent on solar energy for everyone to use.

CRedit authorship contribution statement

Huan Liang wrote the original draft and final version of above paper.

Declaration of Competing Interest

The author did not have any conflict of interest.

Data Availability Statement

No data, models, or code were generated or used during the study.

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[1] Explanation about electricity generation by solar energy from Baidu Baike, web link:
<https://baike.baidu.com/item/%E5%A4%AA%E9%98%B3%E8%83%BD%E5%8F%91%E7%94%B5/6486025?fr=aladdin>